Claims

1. A method for making a modified surface on a polymeric material, the method comprising:

- incubating a photo-initiator-coated polymeric material with an aqueous monomer capable of free radical polymerization; and
- exposing the incubating polymeric material to UV light creating a modified surface on said polymeric material.

2. The method of claim 1, further comprising washing and drying said polymeric material with said modified surface.

3. The method of claim 2, wherein said polymeric material is selected from the group consisting of polyurethanes, polyamides, polyesters, polyethers, polyorganosiloxanes, polysulfones, polytetrafluoroethylene and polysiloxanes.

4. The method of claim 3, wherein said polymeric material is silicone.

5. The method of claim 4, wherein said polymeric material is provided as a device selected from the group consisting of implants, catheters, stents, wound dressings, cardiac valves, tubings, pins and clips.

6. The method of claim 5, wherein said monomer is selected from the group consisting of acrylic acid, methacrylic acid, 2-carboxyethyl acrylate, 4-vinylbenzoic acid, itaconic acid, and mixtures thereof.

7. The method of claim 6, wherein said photo-initiator is selected from the group consisting of peresters, -hydroxyketones, benzil ketals, benzoins and their derivatives and mixtures thereof.

8. The method of claim 7, wherein said photo-initiator is selected from the group consiting of 2,2-dimethoxy-2-phenyl-acetophenone, p-benzoyl tert-butylperbenzoate and mixtures thereof.

9. The method of claim 8, wherein said aqueous monomer additionally

comprises a photo-initiator.

10. The method of claim 9, wherein said photo-initiator is selected from the group consisting of 2,2-dimethoxy-2-phenyl-acetophenone, p-benzoyl tert-butylperbenzoate and mixtures thereof.

11. The method of claim 10, further comprising rendering said modified surface lubricious.

12. The method of claim 11, wherein said modified surface is ionized in an aqueous base to be negatively charged to provide a lubricious surface.

13. The method of claim 12, wherein said aqueous base is selected from the group consisting of disodium tetraborate, sodium carbonate, ammonium hydroxide, calcium hydroxide, sodium hydroxide and mixtures thereof.

14. The method of claim 13, further comprising rendering said lubricious modified surface of said polymeric material antibacterial.

15. The method of claim 14, wherein said polymeric material is incubated in an electrolyte solution to saturate the negatively charged surface with cations prior to incubation in a silver salt.

16. The method of claim 15, wherein said silver salt comprises a salt selected from the group consisting of silver lactate, silver phosphate, silver citrate, silver acetate, silver benzoate, silver chloride, silver carbonate, silver iodide, silver iodate, silver nitrate, silver laurate, silver sulfadiazine, silver palmitate, silver benzoate, silver salicylate, silver thiosulfate and mixtures thereof.

17. The method of claim 10, wherein said polymeric material with said modified surface is coated with a gelatin polyethylene oxide hydrogel having a silver salt incorporated therein.

18. A polymeric composite comprising;

- a polymeric body having a stable polyacrylate modified surface, said surface being hydrophilic, lubricious and anti-microbial.

19. The polymeric composite of claim 18, wherein said polymeric body is made of a polymeric material selected from the group consisting of polyurethanes, polyamides, polyesters, polyethers, polyorganosiloxanes, polysulfones, polytetrafluoroethylene and polysiloxanes.

20. The composite of claim 19, wherein said polymeric material is silicone.

21. The composite of claim 20, wherein said polymeric material is provided as a device selected from the group consisting of implants, catheters, stents, wound dressings, cardiac valves, tubings, pins and clips.

22. The composite of claim 21, wherein said monomer is selected from the group consisting of acrylic acid, methacrylic acid, 2-carboxyethyl acrylate, 4-vinylbenzoic acid, itaconic acid, and mixtures thereof.

23. A method for making a lubricious anti-microbial modified surface on a polymeric material, the method comprising:

- incubating a photo-initiator-coated polymeric material with an aqueous monomer capable of free radical polymerization;
- exposing the incubating polymeric material to UV light creating a modified polymeric surface on said polymeric material;
- rendering said modified polymeric surface lubricious; and
- providing a silver agent to said ionized modified polymeric surface.

24. The method of claim 23, wherein said polymeric material is selected from the group consisting of polyurethanes, polyamides, polyesters, polyethers, polyorganosiloxanes, polysulfones, polytetrafluoroethylene and polysiloxanes.

25. The method of claim 24, wherein said polymeric material is silicone.

26. The method of claim 25, wherein said polymeric material is provided as a device selected from the group consisting of implants, catheters, stents, wound

dressings, cardiac valves, tubings, pins and clips.

27. The method of claim 26, wherein said monomer is selected from the group consisting of acrylic acid, methacrylic acid, 2-carboxyethyl acrylate, 4-vinylbenzoic acid, itaconic acid, and mixtures thereof.

28. The method of claim 27, wherein said photo-initiator is selected from the group consisting of peresters, -hydroxyketones, benzil ketals, benzoins and their derivatives and mixtures thereof.

29. The method of claim 28, wherein said photo-initiator is selected from the group consiting of 2,2-dimethoxy-2-phenyl-acetophenone, p-benzoyl tert-butylperbenzoate and mixtures thereof.

30. The method of claim 23, wherein said aqueous monomer additionally comprises a photo-initiator.

31. The method of claim 30, wherein said photo-initiator is selected from the group consisting of 2,2-dimethoxy-2-phenyl-acetophenone, p-benzoyl tert-butylperbenzoate and mixtures thereof.

32. The method of claim 31, wherein said silver agent is added by immersing said ionized modified polymeric material in an electrolyte solution having a pH of at least about 8.0 followed by immersion in a silver salt solution.

33. The method of claim 31, wherein a hydrogel is covalently bound to said modified polymeric surface.

34. The method of claim 33, wherein said hydrogel comprises a crosslinked matrix of gelatin and poly (ethylene oxide) sequestering a silver agent.

35. The method of claim 32, wherein said silver agent comprises a silver salt selected from the group consisting of silver lactate, silver phosphate, silver citrate, silver acetate, silver benzoate, silver chloride, silver carbonate, silver iodide, silver iodate, silver nitrate, silver laurate, silver sulfadiazine, silver

palmitate, silver benzoate, silver salicylate, silver thiosulfate and mixtures thereof.

36. A method for making a lubricious anti-microbial modified surface on a polymeric material, the method comprising:

- precoating a polymeric material with a photo-initiator;

- immersing the precoated polymeric material in an aqueous solution of vinyl carboxylic acid monomer and exposing the incubating polymeric material to UV light to create a modified non-lubricious polyacrylate surface on said polymeric material;

- ionizing said polyacrylate surface of said polymeric material by immersion in an aqueous base to render said surface lubricious;

- saturating the polyacrylate surface with cations by immersion in an electrolyte solution;

- providing silver to said cation-saturated polyacrylate surface.

37. The method of claim 36, wherein said precoated polymeric material is further washed and dried prior to immersion in monomer.

38. The method of claim 36, wherein said polymeric material is selected from the group consisting of polyurethanes, polyamides, polyesters, polyethers, polyorganosiloxanes, polysulfones, polytetrafluoroethylene and polysiloxanes.

39. The method of claim 38, wherein said polymeric material is silicone.

40. The method of claim 39, wherein said polymeric material is provided as a device selected from the group consisting of implants, catheters, stents, wound dressings, cardiac valves, tubings, pins and clips.

41. The method of claim 40, wherein said monomer is selected from the group consisting of acrylic acid, methacrylic acid, 2-carboxyethyl acrylate, 4-vinylbenzoic acid, itaconic acid, and mixtures thereof.

42. The method of claim 41, wherein said photo-initiator is selected from the group consisting of peresters, -hydroxyketones, benzil ketals, benzoins and their

derivatives and mixtures thereof.

43. The method of claim 42, wherein said photo-initiator is selected from the group consiting of 2,2-dimethoxy-2-phenyl-acetophenone, p-benzoyl tert-butylperbenzoate and mixtures thereof.

44. The method of claim 43, wherein said aqueous monomer solution additionally comprises a photo-initiator.

45. The method of claim 44, wherein said photo-initiator is selected from the group consisting of 2,2-dimethoxy-2-phenyl-acetophenone, p-benzoyl tert-butylperbenzoate and mixtures thereof.

46. The method of claim 45, wherein silver is provided by immersing said ionized polymeric material in a silver salt solution.

47. The method of claim 45, wherein silver is provided by covalently binding a hydrogel to said ionized polyacrylate surface, said hydrogel sequestering a silver salt.

48. The method of claim 46, wherein said silver salt is selected from the group consisting of silver lactate, silver phosphate, silver citrate, silver acetate, silver benzoate, silver chloride, silver carbonate, silver iodide, silver iodate, silver nitrate, silver laurate, silver sulfadiazine, silver palmitate and mixtures thereof.

49. The method of claim 36, wherein said electrolyte solution has a pH of at least about 8.0.

50. The method of claim 49, wherein said electrolyte solution is selected from the group consisting of sodium lactate, sodium acetate, sodium citrate, disodium phosphate, potassium acetate, potassium citrate, dipotassium phosphate and mixtures thereof.

51. The method of claim 50, wherein said electrolyte solution is sodium

lactate.